UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/981,389	10/17/2001	David Graumann	1020.P12451	6813

57035 7590 04/15/2008

KACVINSKY LLC
C/O INTELLEVATE
P.O. BOX 52050
MINNEAPOLIS, MN 55402

EXAMINER	
FAULK, DEVONA E	
ART UNIT	**PAPER NUMBER**
2615	

MAIL DATE	DELIVERY MODE
04/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/981,389	GRAUMANN, DAVID	
	Examiner	Art Unit	
	DEVONA E. FAULK	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7,9-13,15,16 and 18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7,9-13,15,16 and 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments,, filed 12/13/07 with the filing of the pre-appeal brief conference request, with respect to the rejection(s) of claim(s) 1,3-7,9-13,15,16,18 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Panasik et al. (US 6,778,674).

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

3. Claims 2,8,14,17 and 19-26 are cancelled.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1,3-5,7,9-10,12,13,15,16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo (US 6,600,824) in view of Birchfield et al. (U.S. Patent Application 2002/0097885) in further view of Panasik et al. (US 6,778,674).

Regarding **claim 1**, Matsuo discloses an acoustic source localization system and method comprising:

a first microphone (10a, Figure 12; column 16, lines 39-54) located at a first location to detect acoustic waves at the first location;

a second microphone (10b; Figure 12; column 16, lines 39-54) located at a second location to detect the acoustic waves at the second location;

an acoustic analysis device to detect and analyze acoustic waves (11, sound signal estimation part, Figure 12;column 9, lines 55-60; column 16, lines 39-54);

a processing device to determine a spatial location of a source of the acoustic waves (50, Figure 12; column 15, lines 45-58; column 16, lines 50-54) and

in response to the spatial location of the source to at least one of delay an output of the first or second microphone or selectively disable the first or second microphone (column 16, lines 63-column 17, line 9).

Matsuo discloses a teleconferencing environment (column 1, lines 28-31). Teleconferencing is the live exchange of information among persons and machines supported by providing audio, video and data services. It is implicit therefore, that humans would be present.

Matsuo fails to explicitly teach of multiple reflective surfaces to reflect acoustic waves and using the Generalized Cross Correlation Phase Transform.

Burchfield discloses an acoustic source localization system applicable to audio-visual applications and using the Generalized Cross Correlation Phase Transform (page 3, paragraph 0040).

It would have been obvious to modify Matsuo to use the Generalized Cross Correlation Phase Transform to determine a location of a source so that a transform

that has been proven to work in determining the location of an audio source can be used .

Matsuo as modified by Birchfield fails to disclose multiple reflectors having acoustically reflective surfaces of an irregular shape that provide additional phase variation, resulting in improved spatial distinction during analysis, said reflectors structured and arranged to reflect the acoustic waves in the direction of the first and second microphone . Panasik discloses reflectors having an irregular shape and providing additional phase variation (Figure 1a; column 3, lines 54-column 4, line 6; the ears read on multiple reflectors, the phase variation occurs due to the inherent difference in the arrival of sound at the ears which provides spatial distinction; the ears reflect the output of the speakers SP1 and SP2 in the direction of microphones M1, M2.

It would have been obvious to modify Matsuo as modified by Birchfield by using a the reflector that reflects acoustic waves in a direction of the first microphone and the second microphone as taught by Panasik so that the microphones will be pick up a total sound that is undiminished regardless of the location of the sound source.

Regarding **claim 3**, Matsuo as modified by Birchfield and Panasik discloses wherein the at least one acoustically reflective surface is shaped like a human pinnea (See Panasik as applied above to claim 1, pinnea is defined as the externally visible cartilaginous structure of the external ear). Therefore, all elements of claim 3 are comprehended by the rejection of claim 1.

Regarding **claim 4**, Matsuo as modified by Birchfield and Panasik discloses wherein the at least one acoustically reflective surface has low acoustic absorption

properties (See Panasik as applied above to claim 1, the ear has low acoustic absorption properties). Therefore, all elements of claim 4 are comprehended by the rejection of claim 1.

Regarding **claim 5**, Matsuo as modified Birchfield and Panasik discloses a processing device that directs an observation device to the spatial location of the source of the acoustic waves (Birchfield, paragraph 0072).

Regarding **claim 7**, Matsuo discloses a method of determining a spatial location of a source of acoustic waves (and a sound location device, Figure 12; method is implicit in functionality of system), comprising:

Detecting, with a first microphone (10a, Figure 12; column 16, lines 39-54) acoustic waves at a first location;

Detecting, with a second microphone (10b, Figure 12; column 16, lines 39-54) acoustic waves at a second location;

analyzing the acoustic waves (11, sound signal estimation part, Figure 12;column 9, lines 55-60; column 16, lines 39-54);

determining a spatial location of a source of the acoustic waves (50, Figure 12; column 15, lines 45-58; column 16, lines 50-54), and in response to the spatial location of the source, at least one of delaying an output of the first or second microphone, or selectively disabling the first or second microphone (column 16, lines 63-column 17, line 9).

Matsuo discloses a teleconferencing environment (column 1, lines 28-31). Teleconferencing is the live exchange of information among persons and machines

supported by providing audio, video and data services. It is implicit therefore, that humans would be present.

Matsuo fails to explicitly teach of multiple reflective surfaces to reflect acoustic waves and using the Generalized Cross Correlation Phase Transform.

Burchfield discloses an acoustic source localization system applicable to audio-visual applications and using the Generalized Cross Correlation Phase Transform (page 3, paragraph 0040).

It would have been obvious to modify Matsuo to use the Generalized Cross Correlation Phase Transform to determine a location of a source so that a transform that has been proven to work in determining the location of an audio source can be used .

Matsuo as modified by Birchfield fails to disclose reflecting, with multiple reflectors having acoustically reflective surfaces of an irregular shape that provide additional phase variation, resulting in improved spatial distinction during analysis, said reflectors structured and arranged to reflect the acoustic waves in the direction of the first and second microphone . Panasik discloses reflectors having an irregular shape and providing additional phase variation (Figure 1a; column 3, lines 54-column 4, line 6; the ears read on multiple reflectors, the phase variation occurs due to the inherent difference in the arrival of sound at the ears which provides spatial distinction; the ears reflect the output of the speakers SP1 and SP2 in the direction of microphones M1, M2.

It would have been obvious to modify Matsuo as modified by Birchfield by using a the reflector that reflects acoustic waves in a direction of the first microphone and the

second microphone as taught by Panasik so that the microphones will be pick up a total sound that is undiminished regardless of the location of the sound source.

Regarding **claim 12**, Matsuo discloses a method of determining a spatial location of a source of acoustic waves (and a sound location device, Figure 12; method is implicit in functionality of system), comprising:

Detecting, with a first microphone (10a, Figure 12; column 16, lines 39-54) acoustic waves at a first location;

Detecting, with a second microphone (10b, Figure 12; column 16, lines 39-54) acoustic waves at a second location;

analyzing the acoustic waves (11, sound signal estimation part, Figure 12;column 9, lines 55-60; column 16, lines 39-54);

determining a spatial location of a source of the acoustic waves (50, Figure 12; column 15, lines 45-58; column 16, lines 50-54), and in response to the spatial location of the source, at least one of delaying an output of the first or second microphone, or selectively disabling the first or second microphone (column 16, lines 63-column 17, line 9).

Matsuo discloses a teleconferencing environment (column 1, lines 28-31). Teleconferencing is the live exchange of information among persons and machines supported by providing audio, video and data services. It is implicit therefore, that humans would be present.

Matsuo fails to explicitly teach of multiple reflective surfaces to reflect acoustic waves and using the Generalized Cross Correlation Phase Transform and a computer-

readable medium and a computer-readable program code, stored on the computer to execute the localization.

Burchfield discloses an acoustic source localization system applicable to audio-visual applications and using the Generalized Cross Correlation Phase Transform (page 3, paragraph 0040) and discloses a computer-readable medium (Birchfield, RAM; paragraph 0037) and a computer-readable program code, stored on the computer-readable medium (Birchfield, paragraph 0037) having instructions to execute the localization. It would have been obvious to modify Matsuo by storing a program code on a computer readable medium with instruction to execute the localization in order to provide a more efficient method and device and to use the Generalized Cross Correlation Phase Transform to determine a location of a source so that a transform that has been proven to work in determining the location of an audio source can be used .

Matsuo as modified by Birchfield fails to disclose multiple reflectors having acoustically reflective surfaces of an irregular shape that provide additional phase variation, resulting in improved spatial distinction during analysis, said reflectors structured and arranged to reflect the acoustic waves in the direction of the first and second microphone . Panasik discloses reflectors having an irregular shape and providing additional phase variation (Figure 1a; column 3, lines 54-column 4, line 6; the ears read on multiple reflectors, the phase variation occurs due to the inherent difference in the arrival of sound at the ears which provides spatial distinction; the ears reflect the output of the speakers SP1 and SP2 in the direction of microphones M1, M2.

It would have been obvious to modify Matsuo as modified by Birchfield by using a the reflector that reflects acoustic waves in a direction of the first microphone and the second microphone as taught by Panasik so that the microphones will be pick up a total sound that is undiminished regardless of the location of the sound source.

Regarding **claim 9**, Matsuo as modified by Birchfield and Panasik discloses wherein the at least one acoustically reflective surface has low acoustic absorption properties. (See Panasik as applied above to claim 7, the ear has low acoustic absorption properties). Therefore, all elements of claim 9 are comprehended by the rejection of claim 7.

Regarding **claim 10**, Matsuo as modified by Birchfield and Panasik discloses directing an observation device to the determined spatial location of the source of the acoustic waves (Birchfield, paragraph 0072).

Regarding **claim 13**, Matsuo as modified Birchfield and Panasik discloses wherein at least one acoustically reflective surface is utilized to reflect the acoustic sound waves (See Panasik as applied above to claim 12) Therefore, all elements of claim 13 are comprehended by the rejection of claim 12.

Regarding **claim 15**, Matsuo as modified by Birchfield and Panasik discloses wherein the at least one acoustically reflective surface has low acoustic absorption properties. (See Panasik as applied above to claim 12, the ear has low acoustic absorption properties). Therefore, all elements of claim 15 are comprehended by the rejection of claim 13.

Regarding **claim 16**, Matsuo as modified by Birchfield and Panasik discloses wherein the computer-readable program code includes instructions to direct an observation device to the determined spatial location of the source of the acoustic waves (Birchfield, paragraph 0037; paragraph 0072).

3. **Claims 6,11 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo (US 6,660,824) as applied above to claims 1,7 and 12 above and Birchfield et al. (U.S. Patent Application 2002/0097885) as applied above to claims 1,7 and 12 and in further view of Panasik et al. (US 6,778,674).as applied above to claims 1,7 and 12 in view of Nordstrom et al. (US 5,058,419).

Regarding **Claim 6,11 and 18** Matsuo as modified by Birchfield and Panasik teach of computing phase angles corresponding to microphone position (Birchfield, paragraph 0058) . Matsuo as modified by Birchfield and Panasik fail to discloses further including a calibration device to create a set of phase signature tables associating phase angles, between when the acoustic waves reach the first microphone and when the acoustic waves reach the second microphone, with detected frequencies at a predetermine spatial location. Nordstrom teaches of a method for locating a sound source including a calibration device to create a set of phase signature tables associating phase angles, between when the acoustic waves reach the first transducer and when the acoustic waves reach the second transducer, with detected frequencies at a predetermine spatial location (Figure 3; column 3, lines 16-32; column 5, lines 2-20). Therefore, it would have been obvious to one of ordinary skill in the art at the time

of the invention to modify Matsuo as modified Birchfield by creating a phase table as claimed in order to be able to better calculate the location of the sound source.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DEVONA E. FAULK whose telephone number is (571)272-7515. The examiner can normally be reached on 8 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devona E. Faulk/
Examiner
Art Unit 2615
4/13/2008